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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,816	03/04/2004	Min-Hung Lee	0941-0924P	3667

2292 7590 04/28/2005

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EXAMINER

HU, SHOUXIANG

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/791,816		LEE ET AL.	
	Examiner		Art Unit	
	Shouxiang Hu		2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 9-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 02-11-2005.

Applicant's election with traverse of claims 1-8 in the above reply is acknowledged. The traversal is on the ground(s) that search and examination of all claims would place no undue burden on the examiner. This is not found persuasive because, as explained below:

The inventions of Group I and Group II are distinct; they have acquired a separate status in the art as shown by their different classification; and the search required for Group I is not required for Group II. Although only a few of classes/subclasses were given in the previous office action, they are only the exemplary ones. Along with required key word search, a thorough search for the two groups of inventions require search in many additional and different classes/subclasses. Thus, search and examination of all of the claims would impose a substantially undue burden upon the examiner.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claims 1-8 are objected to because of the following informalities and/or defects:

In claim 1, the term of "a source and" should read as: -a source region and a--.

Claim 6 recites a poly-SiGe gate; but claim 1 already defines that the gate is formed of polysilicon.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 5 recites the subject matter that the gate dielectric layer comprises a "metal gate dielectric"; but the specification lacks an adequate description regarding it. And, it is not clear how a metal can function as a gate dielectric.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitzgerald (US 2002/0125471) in view of Puchner (US 6,358,806).

Fitzgerald discloses a strained-channel MOSFET structure (Fig. 5A), comprising: a substrate; a graded SiGe layer (502) on the substrate; a relaxed buffer layer (506; SiGe) on the graded SiGe layer; a strained channel-forming layer (508); a gate dielectric layer (510); a polysilicon gate electrode (512); and source and drain regions (513, 514).

Although Fitzgerald does not expressly disclose that the strained channel-forming layer can also be SiC, one of ordinary skill in the art would readily recognize that SiC is also an art-known commonly used semiconductor material and possesses desirable performance at high temperature and/or at high power, and that strained SiC is desirable for forming a channel layer with improved channel performance, as evidenced in the prior art such as Puchner (see col. 2, lines 8-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the strained SiC channel-forming layer of Puchner into the device of Fitzgerald, so that a MOSFET with desirable and/or improved channel performance would be obtained.

Regarding claims 3 and 6, it is art known that a gate dielectric layer can be desirably formed of a high dielectric constant material; and that doped poly-SiGe is also a well-known material for the gate electrode, as readily evidenced in the prior art such as Currie et al. (US 2003/0057416; see Paragraphs 0045 and 0046, respectively).

Regarding claim 8, it is noted that it is art-known that the semiconductor substrate can be formed of each of the recited doped Ge, III-V group semiconductor, or silicon-on-insulator (SOI).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C-D are cited as being related to a strained-channel MOSFET structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

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Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

April 25, 2005


SHOUXIANG HU
PRIMARY EXAMINER